

CLAIMS:

1. A compound comprising:

(a) at least one neutral, positive or negative increased binding energy species comprising a one-electron atom having an atomic mass of at least four, said increased binding energy species having a binding energy:

(i) greater than the binding energy of the corresponding ordinary species, or

(ii) greater than the binding energy of any species for which the corresponding ordinary species is unstable or is not observed because the ordinary increased binding energy species' binding energy is less than a thermal energy at ambient conditions, or is negative; and

(b) at least one other element.

2. A compound according to claim 1, wherein said one-electron atom comprising helium +1, having a binding energy greater than ordinary helium +1 .

3. A compound according to claim 1, wherein said one-electron atom comprising lithium +2, having a binding energy greater than ordinary lithium +2 .

4. A compound according to claim 1, wherein said one-electron atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3 .

5. A compound comprising:

(a) a positive, negative or neutral increased binding energy atom having an atomic mass of at least four and having a binding energy greater than the binding energy of the corresponding ordinary atom, formed from an ordinary one-electron atom; and

(b) at least one other element.

6. A compound according to claim 5, wherein said one-electron atom comprising helium +1, having a binding energy greater than ordinary helium +1.

7. A compound according to claim 5, wherein said one-electron atom comprising lithium +2, having a binding energy greater than ordinary lithium +2 .

8. A compound according to claim 5, wherein said one-electron atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3 .

9. An increased binding energy atom having an atomic mass of at least four and having a binding energy greater than the binding energy of the corresponding ordinary atom.

10. An increased binding energy atom according to claim 9, wherein said increased binding energy atom is a one-electron atom.

11. An increased binding energy atom according to claim 9, wherein said increased binding energy atom comprising helium +1, having a binding energy greater than

ordinary helium +1.

5 12. An increased binding energy atom according to claim 9, wherein said increased binding energy atom comprising lithium +2, having a binding energy greater than ordinary lithium +2.

10 13. An increased binding energy atom according to claim 9, wherein said increased binding energy atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3.

14. A method of making a compound comprising:

15 (a) at least one neutral, positive or negative increased binding energy species comprising an atom having an atomic mass of at least four, said increased binding energy species having a binding energy:

16 (i) greater than the binding energy of the corresponding ordinary species, or

17 (ii) greater than the binding energy of any species for which the corresponding ordinary species is unstable or is not observed because the ordinary increased binding energy species' binding energy is less than a thermal energy at ambient conditions, or is negative; and

18 (b) at least one other element; said method comprising; reacting a one-electron atom having an atomic mass of at least 4 with a catalyst to release energy from said one-electron atom and form said increased binding energy species; and reacting said increased binding energy species with said at least one other element to form said compound.

30 15. A method according to claim 14, wherein said one-electron atom comprising helium +1, having a binding energy greater than ordinary helium +1 .

35 16. A method according to claim 14, wherein said one-electron atom comprising lithium +2, having a binding energy greater than ordinary lithium +2 .

17. A method according to claim 14, wherein said one-electron atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3 .

18. A method according to claim 14, wherein said catalyst having a net enthalpy of reaction of about $m \times 27.2$ eV, where m is an integer.

40 19. A method of making a compound comprising:

45 (a) a positive, negative or neutral increased binding energy atom having an atomic mass of at least four and having a binding energy greater than the binding energy of the corresponding ordinary atom; and

(b) at least one other element; said method comprising; reacting a one-electron atom having an atomic mass of at least 4 with a catalyst to release energy from said one-electron atom and form said increased binding energy atom; and reacting said increased binding energy atom with said at least one other element to form said compound.

20. A method according to claim 19, wherein said one-electron atom comprising helium +1, having a binding energy greater than ordinary helium +1 .

5 21. A method according to claim 19, wherein said one-electron atom comprising lithium +2, having a binding energy greater than ordinary lithium +2 .

22. A method according to claim 19, wherein said one-electron atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3 .

10 23. A method according to claim 19, wherein said catalyst having a net enthalpy of reaction of about $m \times 27.2$ eV, where m is an integer.

24. A method of making an increased binding energy atom having an atomic mass of at least four and having a binding energy greater than the binding energy of the corresponding ordinary atom, said method comprising:
reacting a one-electron atom having an atomic mass of at least 4 with a catalyst to release energy from said one-electron atom and form said increased binding energy atom.

20 25. A method according to claim 24, wherein said one-electron atom comprising helium +1, having a binding energy greater than ordinary helium +1 .

26. A method according to claim 24, wherein said one-electron atom comprising lithium +2, having a binding energy greater than ordinary lithium +2 .

25 27. A method according to claim 24, wherein said one-electron atom comprising beryllium +3, having a binding energy greater than ordinary beryllium +3 .

30 28. A method according to claim 24, wherein said catalyst having a net enthalpy of reaction of about $m \times 27.2$ eV, where m is an integer.